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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/898,162	07/03/2001	Amit Anil Nanavati	JP920010141US1	2569

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EXAMINER
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YANG, LINA

ART UNIT	PAPER NUMBER
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2665

DATE MAILED: 01/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/898,162

Applicant(s)

NANAVATI ET AL.

Examiner

Lina Yang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1-21 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Johansson et al (U. S. Patent Application No. 20020044549 A1) in view of Salonidis et al. (U. S. Patent No. 6,865,371 B2), and further in view of admitted prior art (APA) in lines 6-9 on page 2 of current specification.

Regarding claims 1, 8 and 15(differ by statutory classes), Johansson discloses a method /system for optimal clustering of master-slave ad-hoc wireless network,

comprising: interconnecting said subgroups to form a single cluster either by connecting a slave node at the boundary of one subgroup to the master of an adjacent subgroup where possible (slave 720 in piconet 1 to the master M2 in piconet 2 in fig. 7), or by connecting two adjacent master nodes together (Master M2 in piconet 2 to the master M3 in piconet 3 in fig. 7) or by converting a slave node (M4 was a slave in piconet 2 but master in TS1) to at the boundary to a master and linking it to the slave nodes or master nodes in the adjacent subgroups (M4 to M2).

Johansson also discloses that the well-known method with centralized mechanism for forming a maximum Connectivity Scatternet (subgroup) has been used ([0068]). But, Johansson fails to teach the method in detail. However, Salonidis from the similar field of endeavor, teaches assigning master (fig. 5; col. 12 lines 11-16) or slave status (fig. 5; col. 11 lines 53 and col. 12 lines 7-10) to each node and connecting slave nodes to master nodes to form subgroups (piconet) based on defined optimization parameters comprising any of an amount of neighbor nodes of each node (col. 4 lines 44-46 and col. 12 lines 29-31). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to include assigning master or slave status to each node and connecting slave nodes to master nodes to form subgroups based on defined optimization parameters and the constraints and characteristics of the network as taught by Salonidis in the assembly of Johansson in order to form a subgroup (piconet) with a designated master which imposes a frequency-hopping pattern on the rest of the nodes or devices functioning as slaves.

The modified assembly of Johansson and Salonidis differs from the claimed invention in that the modified assembly does not specifically teach that the defined optimization parameters further comprising a power consumption of the node. However, APA in lines 6-9 on page 2 of current specification admitted that the invention in US patent 6,026,303 teaches dynamically determining the most optimal master node based on defined conditions of power consumption and communication error rates. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to include power consumption of the node as the defined optimization parameters, as taught by APA in the modified assembly of Johansson and Salonidis in order to choose the node with the remaining battery power quantity data more than a predetermined value as the true parent wireless terminal, further prevents disconnecting the communication because of power down in the parent wireless terminal.

Regarding claim 15, the modified assembly of Johansson, Salonidis and APA further differs from the claimed invention in that it does not specifically teaches using the computer program product to carry out the claimed method. However, it's well known in the art to use computer programs to automatically perform algorithms with heavy calculations. Therefore, it would have been obvious for one having ordinary skill in the art at the time when the invention was made to implement a method and a system using a computer system incorporated with a computer program product to automate the

process for nodes discovery and assignments; and formations of subgroups (piconets) and clusters (scatternets) in an ad-hoc network.

Regarding claims 2 and 9, Salonidis further discloses that each node is assigned master or slave based on the degree of connectivity of said node with other unassigned nodes (col.4 lines 14-23).

Regarding claim 16, the modified assembly of Johansson, Salonidis and APA further differs from the claimed invention in that it does not specifically teaches using the computer program product to carry out the claimed method. However, it's well known in the art to use computer programs to automatically perform algorithms with heavy calculations. Therefore, it would have been obvious for one having ordinary skill in the art at the time when the invention was made to implement a method and a system using a computer system incorporated with a computer program product to automate the process.

Regarding claims 3 and 10, Salonidis further teaches the assignment is implemented by a single entity (the "coordinator") located either within the cluster as one of the nodes (as a "master" when one piconet is formed; col. 12 lines 7-10) or outside the cluster (outside the piconet when the coordinator assigns a node as another master to form a new piconet; col. 12 lines 11-17).

Regarding claim 17, the modified assembly of Johansson, Salonidis and APA further differs from the claimed invention in that it does not specifically teaches using the computer program product to carry out the claimed method. However, it's well known in the art to use computer programs to automatically perform algorithms with heavy calculations. Therefore, it would have been obvious for one having ordinary skill in the art at the time when the invention was made to implement a method and a system using a computer system incorporated with a computer program product to automate the process.

Regarding claims 4 and 11, although the assembly of Johansson, Salonidis and APA does not specifically points out that the formation of clusters and interconnection between the said clusters is based on weight associated with each node in the network where the weight of a node depends upon the number of nodes in its neighborhood, however Johansson and Salonidis both disclose the neighbor nodes inquiring ([0013] in Johansson and col. 1 lines 58-60 in Salonidis). Specifically, Johansson teaches that ad-hoc networks are dynamic, ad-hoc networking technology typically has a neighbor discovery feature. The neighbor discovery feature allows one node to find any other node within radio range with which the first node can communicate with and consequently form an ad-hoc network with ([0013]). Further more, Johansson teaches that scatternets should be formed by maximum connectivity, i.e. maximum connectivity scatternet (MCS) ([0024]). It would have been obvious for one of ordinary skill in the art to understand that the "maximum connectivity" depends on the number of neighboring

nodes, for example, the nodes with the largest number of neighbors should serve as masters. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate the formation of clusters and interconnection between the said clusters based on weight associated with each node in the network where the weight of a node depends upon the number of nodes in its neighborhood in the assembly of Johansson, Salonidis and APA in order to identify the nodes and form efficient scatternets.

Regarding claim 18, the modified assembly of Johansson, Salonidis and APA further differs from the claimed invention in that it does not specifically teaches using the computer program product to carry out the claimed method. However, it's well known in the art to use computer programs to automatically perform algorithms with heavy calculations. Therefore, it would have been obvious for one having ordinary skill in the art at the time when the invention was made to implement a method and a system using a computer system incorporated with a computer program product to automate the process.

Regarding claims 5 and 12, both Johansson and Salonidis further disclose that the method/system is applied to the formation of a scatternet in a Bluetooth network ([0024] in Johansson and col. 4 line 35-37 in Salonidis).



Regarding claim 19, the modified assembly of Johansson, Salonidis and APA further differs from the claimed invention in that it does not specifically teaches using the computer program product to carry out the claimed method. However, it's well known in the art to use computer programs to automatically perform algorithms with heavy calculations. Therefore, it would have been obvious for one having ordinary skill in the art at the time when the invention was made to implement a method and a system using a computer system incorporated with a computer program product to automate the process.

Regarding claims 6 and 13, Johansson further disclose a method/system with a distributed manner at each node further comprising: assigning master or slave status to itself by each node based on the master or slave or unassigned status of all neighboring connected nodes (figs. 9A-9C and the corresponding descriptions), forming subgroups around each master node (figs. 9A-9C and the corresponding descriptions), merging said subgroups by forming slave-slave bridges (slave S2 in piconet 1 to the slave D2 in piconet 2 in fig. 7) or slave-master bridges (slave 720 in piconet 1 to the master M2 in piconet 2 in fig. 7) or master-master bridges (Master M2 in piconet 2 to the master M3 in piconet 3 in fig. 7) wherever possible based on network constraints or by forming additional masters where necessary.

Regarding claim 20, the modified assembly of Johansson, Salonidis and APA further differs from the claimed invention in that it does not specifically teaches using the

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computer program product to carry out the claimed method. However, it's well known in the art to use computer programs to automatically perform algorithms with heavy calculations. Therefore, it would have been obvious for one having ordinary skill in the art at the time when the invention was made to implement a method and a system using a computer system incorporated with a computer program product to automate the process.

Regarding claims 7 and 14, both Johansson and Salonidis further disclose that the method/system is applied to the formation of a Bluetooth scatternet ([0024] from Johansson and col. 4line 35-37 from Salonidis).

Regarding claim 21, the modified assembly of Johansson, Salonidis and APA further differs from the claimed invention in that it does not specifically teaches using the computer program product to carry out the claimed method. However, it's well known in the art to use computer programs to automatically perform algorithms with heavy calculations. Therefore, it would have been obvious for one having ordinary skill in the art at the time when the invention was made to implement a method and a system using a computer system incorporated with a computer program product to automate the process.

***Conclusion***

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

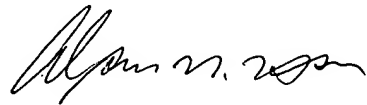
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2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lina Yang whose telephone number is (571) 272-3151. The examiner can normally be reached Monday through Wednesday between 7:00 a.m. and 8:00 p.m. eastern standard time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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ALPUS H. HSU  
PRIMARY EXAMINER